

7 MITIGATION MEASURES

For the purposes of this assessment the term ‘mitigation measures’ are considered to be ‘those measures which aim to minimise, or even cancel, the negative impacts on a site that are likely to arise as a result of the implementation of a plan or project. These measures are an integral part of the specifications of a plan or project’ (Guidance document on Article 6(4) of the Habitats Directive 92/43/EEC, January 2007).

Based on the Appropriate Assessment carried out in **Section 5**, the mitigation will focus on the following potential pollution pathway:

- Surface water and ground pollution; and
- Scheduled invasive species.

IMS will be required to comply with, and implement, the requirements and mitigation measures as set out in **Section 7.1**, **Section 7.2** and **Section 7.3**. It is required that these measures be incorporated, in full, into the site’s Environmental Management System (EMS) (**Section 7.4**).

Residual effects of the proposed development following mitigation measures outlined in this section are discussed in **Section 7.5**.

7.1 Surface Water and Groundwater Management

7.1.1 Construction

The construction works shall be undertaken within a framework of environmental protection practices defined and co-ordinated via the EMS. The EMS shall provide measures that meet legislative requirements, industry best practice and key regulatory guidance that define good working practices during construction, most notably the CIRIA guidance for the ‘Control of Water Pollution from Construction Sites’ (CIRIA, 2001).

During construction, IMS must ensure that:

- Topsoil shall be:
 - Stripped to an average depth of 300mm over the whole site area bounded by the temporary fencing;
 - Maintained in a tidy condition, separate from general spoil, with side slopes not steeper than 1 in 3;
 - Maintained in good condition keeping weeds under control and preventing vermin infestation.
- Stockpiling of construction materials shall be strictly prohibited within 5m of any ditch or water-laden channel, and appropriate management of excess material stockpiles will be enforced, to prevent siltation of watercourses;
- Excavations shall be left open for minimal periods to avoid acting as a conduit for surface water flows;
- All ready-mixed concrete shall be brought to site by truck. A suitable risk assessment for wet concreting will be completed prior to works being carried out which will include measures to prevent discharge of alkaline waste waters or contaminated storm water to the underlying subsoil. Wash down and washout of concrete transporting vehicles will take place at an appropriate facility offsite;
- Concrete shall be contained and managed appropriately to prevent pollution of watercourses. Concrete pouring will be prevented during periods of heavy rainfall, and quick setting mixes will be used;
- Waste materials shall be stored in designated areas that are isolated from surface water drains. Skips will be closed or covered to prevent materials being blown or washed away and to reduce the likelihood of contaminated water leakage;

- Temporary construction compounds shall not be located within 20 m of watercourses, or where it is likely that groundwater will be encountered;
- No harmful materials shall be deposited into nearby watercourses, including drainage ditches/pipes, on or adjacent to the site;
- All seven existing outfalls (SWD1-7) shall have a maintainable geotextile membrane (equivalent to Terrastop™ Premium; 250 micron; 45 l/m²/sec) installed. Installation, maintenance, and removal will follow the manufacturers' specifications. The geotextile membrane will be inspected at least once a week, and following any period of heavy rainfall;
- Any dewatering of standing water within the proposed development site shall require a Dewatering Plan to be incorporated into the Specified Engineering Works for agreement with the EPA prior to major works on site. This plan will include a commitment to dewatering (to the existing attenuation ponds), at a rate equivalent to greenfield run-off; and
- Protection measures shall be put in place to ensure that all hydrocarbons used during the Construction are appropriately handled, stored and disposed of in accordance with recognised standards. These measures will include:
 - Hazardous materials including diesel, fuel oils, solvents, paints and/or lubricants stored on site will be stored within suitably designed bunded areas with a bund volume of 110% of the capacity of the largest tank/container.
 - Re-fuelling of plant will not occur within 50 m of any watercourse or surface water/groundwater feature. Drip trays will be used and spill kits will be kept available;
 - Machinery used on site will be regularly inspected to ensure there is no leakage from them and to ensure the machinery will not cause contamination of watercourses;
 - Where required, fuel will be transported in a mobile, double skinned tank and a spill tray will be used when refuelling (if taking place outside a compound area);
 - Waste oils and hydraulic fluids will be collected in leak-proof containers and removed from the site for disposal or re-cycling;
 - Only emergency breakdown maintenance will be carried out on site. Emergency procedures and spillage kits will be readily available at strategic site locations and construction staff will be familiar with emergency procedures; and
 - Any spillage of fuels, lubricants or hydraulic oils will be immediately contained, with an appropriate emergent response put in place (**Section 7.3**). Any contaminated soil will be removed from the site and properly disposed of.

The plan will cover all potentially polluting activities and include an emergency response procedure. All personnel working on the site will be trained in the implementation of the procedures. All personnel will comply with the following guidance documents:

- CIRIA – Guideline Document C532 Control of Water Pollution from Construction Sites (CIRIA, 2001) and;
- CIRIA – Guideline Document C624 Development and Flood Risk - guidance for the construction industry (CIRIA, 2004).

7.1.2 Operation

During operation, under the strict conditions of the IE Licence and regulated by the EPA, IMS must ensure that:

- A buffer area of a minimum 50m should be retained between the Ballough Stream and all works. No works, material storage or stockpiling may take place within this buffer which should be clearly delineated for all operators;
- The proposed attenuation pond is designed at a capacity of 15,000m³ to cater for a 1 in 100-year storm event. Discharge from the pond will be at greenfield run off rates through the use of flow control unit via a monitoring chamber to the stream that bounds the site to the north;

- The cell layout proposed is to minimise any potential leachate risk to the groundwater body and indirectly to any surface water body. The inert cells are located on the southern sections of the site where the underlying groundwater body (i.e. the Loughshinny Formation) is identified as locally important and extremely vulnerable. The north of the site is underlain by a poor aquifer with much greater natural protection and lower vulnerability, so the non-hazardous waste cells are located in this area;
- The foul water treatment system should be provided with an alarm to indicate operation failure in line with the requirements of EN12566:3. The system must meet the minimum performance standards set out in the EPA Code of Practice. Monitoring and maintenance of this system is required to ensure that effluent is treated to this standard;
- The facility will remain an EPA licenced facility. Under the terms of the revised IE Licence, pollution mitigation measures are designed to prevent or reduce the risk of significant impact by contaminated run-off to surface water. Compliance is verified through regular quality monitoring of surface water and surface water discharge points and submitting the results to the EPA. This will include the new discharge point from the attenuation pond (SWD8) which will be subject to ongoing monitoring and reporting to regulate the discharge;
- Incoming landfill waste shall:
 - Be placed in cells that are situated above the piezometric head in the underlying aquifer unit. Currently, in areas where the base of the quarry lies below 104.5 m (Above Ordinance Datum) the formation level will be backfilled with clean granular materials quarried from the facility, prior to install of the basal liner in accordance with the conditions the EPA licence. The formation level shall be reviewed and where necessary modified, for all new cells using the more detailed groundwater level dataset available for the site; with prior agreement with the EPA. As such, it can be ensured that all cells will be constructed above groundwater level within the principal aquifer units on the site and will not, therefore, affect the groundwater flow regime therein;
 - Be deposited in cells constructed with a liner that meets the specific requirement of the Landfill Directive for each cell type (as specified in **Section 2**), thus reducing the potential for leakage to underlying groundwater; and
 - Be subject to detailed Waste Acceptance Protocols, which are agreed with the EPA.
- The geo-textile membranes installed at all seven outfalls (SWD1-7) will be maintained throughout the lifetime of the operation of the proposed development (e.g. 25 years), and will follow the manufacturers' specifications;
- The leachate storage tanks (a set of twin 532m³ tanks) will be located in a fully bunded area surrounded by a 1m high concrete wall capable of containing 110% capacity of the largest tank (i.e. 532 x 110% = 585m³); and
- Protection measures will be put in place to ensure that all hydrocarbons used during the operation are appropriately handled, stored and disposed of in accordance with recognised standards. These measures will include:
 - Hazardous materials including diesel, fuel oils, solvents, paints and/or lubricants stored on site will be stored within suitably designed bunded areas with a bund volume of 110% of the capacity of the largest tank/container;
 - Re-fuelling of plant will not occur within 50 m of any watercourse or surface water/groundwater feature. Drip trays will be used and spill kits will be kept available;
 - Machinery used on site will be regularly inspected to ensure there is no leakage from them and to ensure the machinery will not cause contamination of watercourses;
 - Where required, fuel will be transported in a mobile, double skinned tank and a spill tray will be used when refuelling (if taking place outside a compound area);
 - Waste oils and hydraulic fluids will be collected in leak-proof containers and removed from the site for disposal or re-cycling;
 - Only emergency breakdown maintenance will be carried out on site. Emergency procedures and spillage kits will be readily available at strategic site locations and construction staff will be familiar with emergency procedures; and

- Any spillage of fuels, lubricants or hydraulic oils will be immediately contained, with an appropriate emergent response put in place (**Section 7.3**). Any contaminated soil will be removed from the site and disposed of properly.

7.2 Invasive Species Management

IMS are currently accepting waste containing the scheduled invasive species Japanese knotweed, under licence W0129-02. The methods for disposal have been agreed with the EPA, and a management plan has been produced and is available in **Appendix E**.

The presence of invasive alien plant species has the potential to lead to an offence under the European Communities (Birds and Natural Habitats) Regulations 2011 (S.I. No. 477 of 2011). Regulation 49 of the 2011 Regulations prohibits (unless under licence) the breeding, release, or allowing or causing the dispersal from confinement of any animal listed in the Third Schedule of the Regulations; or the planting, allowing or causing dispersal, and spreading of any plant listed in the Third Schedule.

It is an offence to plant or encourage the spread of any third schedule invasive species by moving contaminated soil from one place to another, or incorrectly handling and transporting contaminated material or plant cuttings. Persons must therefore take all reasonable steps and exercise due diligence to avoid committing an offence under the 2011 Regulations (as amended).

Although no scheduled invasive plants are known to grow within the proposed development site, there is potential for these species to enter and spread throughout the proposed development site during construction and operation phases.

7.2.1 Construction

During construction, IMS must ensure that:

- An Invasive Species Management Plan (ISMP) shall be prepared by a suitable qualified ecologist/invasive species specialist pre-construction. The ISMP will include management protocols for dealing with occurrences of scheduled invasive species, including mitigation procedures set out in the management plan for Japanese knotweed in **Appendix E**;
- A pre-construction survey (carried out by a suitably qualified ecologist/invasive species specialist in the correct botanical season: e.g. April - September) shall be carried out immediately in advance of construction activities;
- All machinery entering the site during construction activities shall be free from contamination with scheduled invasive plants. This can be achieved through wheel wash stations for vehicles entering and exiting the proposed development site;
- The materials which are introduced to the site during the construction shall be free from scheduled invasive species, with certification of such; and
- Where a scheduled invasive species is accidentally introduced or becomes established within the proposed development site during pre-construction surveys and/or the construction phase, works shall be immediately halted and an effective exclusion zone will be erected (minimum 7 m) until such time that a suitably qualified ecologist/invasive species specialist can assess the site(s), and implement the required management protocol (as set out in the ISMP).

7.2.2 Operation

During operation, IMS must ensure that:

- An invasive species monitoring survey (carried out by a suitably qualified ecologist/invasive species specialist in the correct botanical season: e.g. April - September) shall be carried out annually for the duration of infilling activities (i.e. 25 years) and for a minimum of three years after completion of infilling works. The findings of each survey will be reported to the Local Authority (in this case FCC) and retained for auditing purposes;

- All machinery entering the site during operation activities shall be free from contamination with scheduled invasive plants (excluding licenced loads known to contain Japanese knotweed). This can be achieved through wheel wash stations for vehicles entering and exiting the proposed development site; and
- Where a scheduled invasive species is accidentally introduced or becomes established within the proposed development site during operation, or recorded during monitoring surveys, works shall be immediately halted and an effective exclusion zone will be erected (minimum 7 m) until such time that a suitably qualified ecologist/invasive species specialist can assess the site(s), and implement the required management protocol (as set out in the ISMP).

7.3 Emergency Response and Environmental Training

IMS shall produce an Emergency Response Plan (ERP) which will be included in the EMS (see **Section 7.4**). The ERP will include:

- IMS proposed training of relevant staff, including cover staff, in the implementation of the ERP and the use of spill kits;
- A method for which all IMS staff, and/or any Contractor staff appointed by IMS, will be briefed regarding the biodiversity value of the surrounding landscape, to ensure that there are no accidental or unintentional actions conducted during the project construction/operation that could lead to a reduction in water quality. Such matters often arise accidentally through lack of awareness rather than as a result of an intentional action;
- A method for which all IMS will ensure that all personnel working on site are trained in pollution incident control response. A regular review of weather forecasts of heavy rainfall is required and IMS is required to prepare a contingency plan for before and after such events;
- The details of procedures to be undertaken by IMS in the event of the release of any sediment into a watercourse, or any spillage of chemicals, fuel or other hazardous wastes, non-compliance incidents with any permit or licence, or other such risks that could lead to a pollution incident, including flood risks;
- Information on clean-up procedures to include the following:
 - IMS will immediately initiate appropriate clean-up operations and notify any sediment releases, hydrocarbon leakages or spillages to the EPA as an incident;
 - IMS will contain the bulk of the spill immediately using a spill kit before placing the contaminated absorbent material and the contaminated soil in a stockpile at least 50 m from, and downslope of any watercourses; and
 - All contaminated material will be underlain and covered by plastic to prevent leachate generation, until such time as it can be removed off-site by an appropriately licensed waste management company.

7.4 Management Plans

IMS will update the existing Environmental Management System required under the Waste Licence to manage the environmental mitigation measure outlined in this NIS. The EMS will be agreed with a suitable qualified ecologist/environmental specialist prior to completion of construction activities. The EMS will remain a 'live' document throughout the duration of the operation activities, to allow for the input and updating throughout.

The EMS will incorporate the following measures:

- All operation mitigation measures for surface water and groundwater set out in **Section 7.1.2**;
- All operation mitigation measures for IAPS set out in **Section 7.2.2**; and
- Emergency response and environmental training set out in **Section 7.3**.

7.5 Residual Impacts

Irish Government guidance states that:

'If the competent authority considers that residual adverse effects remain, then the plan or project may not proceed without continuing to stage 3 of the AA process: Alternative Solutions' (DoEHLG, 2010).

Taking into account the mitigation measures identified and set out in this NIS, no residual adverse effects within the Zol of the proposed development have been identified (**Table 7-1**).

Table 7-1 Identification of Residual Adverse Effects within the Zone of Influence of the Proposed Development

Relevant Interests / Conservation Interests	Qualifying Potential Impacts Identified	Potential Cumulative Impacts Identified	Mitigation Proposed	Residual Adverse Effects Identified
Estuaries	Surface water and groundwater pollution, and dispersal of scheduled invasive species.	None	Yes	None
Mudflats and sandflats	Surface water and groundwater pollution, and dispersal of scheduled invasive species.	None	Yes	None
<i>Salicornia</i> and other annuals colonising mud and sand	Surface water and groundwater pollution, and dispersal of scheduled invasive species.	None	Yes	None
Atlantic salt meadows	Surface water and groundwater pollution, and dispersal of scheduled invasive species.	None	Yes	None
Mediterranean salt meadows	Surface water and groundwater pollution, and dispersal of scheduled invasive species.	None	Yes	None
Greylag Goose	Surface water and groundwater pollution, and dispersal of scheduled invasive species.	None	Yes	None
Light-bellied Brent Goose	Surface water and groundwater pollution, and dispersal of scheduled invasive species.	None	Yes	None
Shelduck	Surface water and groundwater pollution, and dispersal of scheduled invasive species.	None	Yes	None
Shoveler	Surface water and groundwater pollution, and dispersal of scheduled invasive species.	None	Yes	None
Oystercatcher	Surface water and groundwater pollution, and dispersal of scheduled invasive species.	None	Yes	None
Ringed Plover	Surface water and groundwater pollution, and dispersal of scheduled invasive species.	None	Yes	None
Grey Plover	Surface water and groundwater pollution, and dispersal of scheduled invasive species.	None	Yes	None
Knot	Surface water and groundwater pollution, and dispersal of scheduled invasive species.	None	Yes	None
Dunlin	Surface water and groundwater pollution, and dispersal of scheduled invasive species.	None	Yes	None
Black-tailed Godwit	Surface water and groundwater pollution, and dispersal of scheduled invasive species.	None	Yes	None
Redshank	Surface water and groundwater pollution, and dispersal of scheduled invasive species.	None	Yes	None
Wetland	Surface water and groundwater pollution, and dispersal of scheduled invasive species.	None	Yes	None